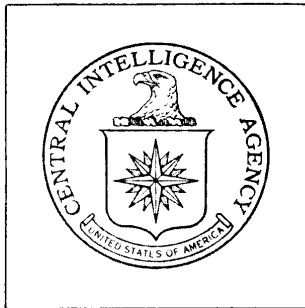


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DIRECTORATE OF
INTELLIGENCE

**Industrial Facilities
(Non-Military)**

Basic Imagery Interpretation Report

Ufa Petroleum Refinery Novo Chernikovsk

Ufa, USSR



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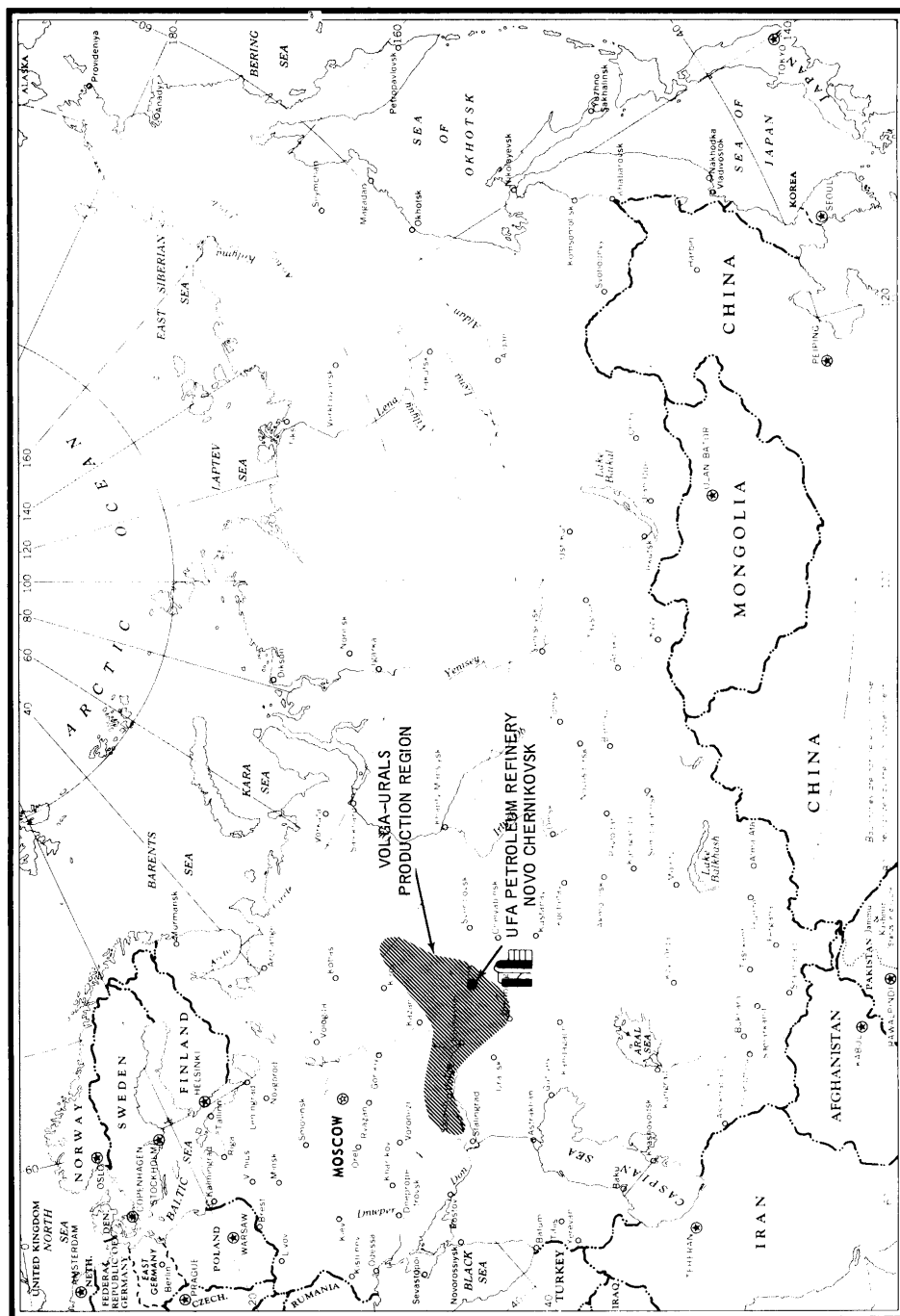


FIGURE 1. LOCATION MAP.

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INTRODUCTION

Ufa Petroleum Refinery Novo Chernikovsk is situated on the northeast bank of the Belaya River, approximately 12 nautical miles (nm) north-northeast of Ufa (see Figure 1). The refinery is located 1 nm north of Ufa Petroleum Refinery Novo Ufimskiy [] and 3.5 nm north of Ufa Petroleum Refinery Staro Ufimskiy []. The Ufa Chernikovsk refinery began operating in late 1957. 1/

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Rail service into the refinery is provided by a spur from the main line between Ufa and Chelyabinsk. Crude oil to charge the refinery is brought by pipeline and rail from the Bashkirskaya and Tartarskaya oilfields in the Volga-Urals production region. 2/

Electric power for the refinery is produced at the collocated Ufa Heat and Thermal Power Plant Novo Ufimskiy TET 3 []. Ufa Rocket Engine Test Facility [] is located 2.5 nm north of the refinery.

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BASIC DESCRIPTION

Physical Features

This refinery measures approximately 13,800 by 5,500 feet and covers about 1,350 acres. It is completely secured by a wall (see Figures 2 and 3).

Operational Functions

This refinery is one of the 15 largest in the Soviet Union with respect to charge capacity. The major refining units presently in operation at this plant include crude oil distillation units, catalytic and thermal cracking units, light-ends recovery units, lubricating oil production units, probable gas processing units, possible catalytic reforming units, a possible hydroforming unit, and several unidentified processing units. Some of these unidentified units possibly produce petrochemicals or petrochemical feedstocks.

Based on the identification of processing units, the products of the refinery include straight-run, cracked, and blended gasolines in a wide range of octane ratings, kerosene, diesel and fuel oils, lubricating oils, waxes, asphaltic materials, and possibly petrochemical feedstocks or petrochemicals.

Construction and Operational Status

The earliest photography used in this study is from April 1962. At that time the primary distillation units, the catalytic and thermal cracking units, the light-ends recovery units, the deasphalting units, the blending and treating facilities, the probable gas processing units, the possible desalting units and the possible hydroforming unit were complete. The loading racks and most of the present storage tanks were also in place at that time. One of the two possible catalytic reforming units, the phenol extraction units, the clay treatment unit, the probable solvent recovery unit, and two of the three dewaxing units were under construction.

Photography of September 1964 revealed that the lubricating oil plant was operational, as construction had been completed on the phenol extraction units, the clay treatment unit, the probable solvent recovery unit, and two of the three dewaxing units. The third dewaxing unit was in the midstages of construction at that time. The possible catalytic reforming unit had been completed and construction had begun on several unidentified processing units at the north end of the refinery. Based on grouping, location and appearance of this processing equipment, these units are possibly preparing petrochemical feedstocks or producing petrochemicals.

In May 1965, the third dewaxing unit had been completed and the second possible catalytic reforming unit was under construction. Construction was continuing on the unidentified processing units and an additional large unidentified processing unit (Area A) had been started.

Between May 1965 and March 1969 a small packing and shipping facility and a probable blending and treating unit were constructed at the north end of the refinery. The second possible catalytic reforming unit and all of the unidentified processing units except the large one in Area A were completed. An additional large unidentified processing unit was in the early stages of construction in Area Z.

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In August 1969, the date of the latest good-quality photography, the unidentified processing facility in Area A was nearing completion and the unit in Area Z was still in the early stages of construction. Three additional areas (Areas A4, J3 and T4) of the refinery were also under construction at that time.

On all missions studied the refinery appeared to be in operation.

Facilities and Equipment

Table I lists the functional areas and equipment within the refinery. In areas which are still under construction and whose function is undetermined, the buildings and processing equipment are not listed in Table I or shown on the line drawing. All measurements in Table I are rounded to the nearest half-meter.

Table I. Equipment and Facilities at the Ufa Petroleum Refinery
Novo Chernikovsk (keyed to Figure 3)

<u>Area</u>	<u>Functional Description</u>	<u>Equipment and Facilities</u>	
A	U/I Processing		
	(1) U/I Processing U/C		
	(2) Packing and Shipping	3 Packing buildings 1 Support building 7 Cylindrical storage tanks, 9 meters in diameter 1 Gasholder, <input type="text"/> 3 Horizontal storage tanks, 12 meters long	25X1
	(3) U/I Secondary Processing	2 Clusters of processing equipment 1 Bank of heat exchangers/cooling coils/accumulators 2 Pipe furnaces 1 Loading rack 5 Processing buildings 5 Support buildings	
	(4) U/I Processing U/C		
B	Blending, Treating, Storage Packing and Shipping	76 Miscellaneous buildings	
		1 Pipe furnace	
		6 Cooling towers	
		193 Cylindrical storage tanks	
		19 24-meter-diameter	
		3 <input type="text"/>	25X1
		35 15-meter-diameter	
		13 <input type="text"/>	25X1
		7 12-meter-diameter	
		19 <input type="text"/>	25X1
		3 9-meter-diameter	
		32 <input type="text"/>	25X1
		53 6-meter-diameter	
		9 <input type="text"/>	25X1
		4 Spherical storage tanks, 12 meters in diameter	
		1 Gasholder, 15 meters in diameter	
		47 Horizontal storage tanks	
		29 <input type="text"/>	25X1
		18 12-meter-long	
		3 Semiburied cylindrical storage tanks (not measured)	
C	Administration and Support	18 Miscellaneous buildings	

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Area	Functional Description	Equipment and Facilities
D	Probable Gas Processing	<p>2 Units, each with</p> <ul style="list-style-type: none"> 2 clusters of processing equipment 1 compressor building 2 cylindrical storage tanks, [] 25X1 [] 25X1 2 spherical storage tanks, 12 meters in diameter. <p>One unit has 3 horizontal storage tanks</p> <ul style="list-style-type: none"> 1 15-meter-long 2 6-meter-diameter <p>The other unit has 4 horizontal storage tanks</p> <ul style="list-style-type: none"> 2 15-meter-long 2 6-meter-long <p>3 Support buildings</p>
E	Possible Desalting	<p>3 Units, each with</p> <ul style="list-style-type: none"> 2 clusters of processing equipment 1 bank of heat exchangers/cooling coils/accumulators 1 compressor building 4 horizontal storage tanks (not measured) <p>5 Support buildings</p>
F	Blending, Treating, Storage, Packing and Shipping	<p>1 Blending and treating unit with</p> <ul style="list-style-type: none"> 10 batch agitators/mixers 1 pipe furnace 1 blending building 1 packing and shipping building 2 support buildings 4 cylindrical tanks 2 6-meter-diameter 2 3-meter-diameter <p>1 Blending and treating unit with</p> <ul style="list-style-type: none"> 4 batch agitators/mixers 1 packing and shipping building 1 support building 4 horizontal tanks, 9 meters long <p>2 Loading racks</p> <p>53 Miscellaneous buildings</p> <p>123 Cylindrical storage tanks</p> <ul style="list-style-type: none"> 37 24-meter-diameter 15 15-meter-diameter 17 [] 25X1 10 12-meter-diameter 16 [] 25X1 12 9-meter-diameter 4 [] 25X1 5 6-meter-diameter 2 [] 25X1 5 3-meter-diameter <p>30 Horizontal storage tanks</p> <ul style="list-style-type: none"> 14 [] 25X1 16 9-meter-long <p>3 Semiburied cylindrical storage tanks (not measured)</p> <p>2 Water storage basins</p>
G	Probable Blending and Treating	<p>1 Probable blending building (165 by 34 meters) with 10 batch agitators/mixers</p> <p>8 Support buildings</p>
H	Possible Petrochemical Processing	<p>1 Unit with</p> <ul style="list-style-type: none"> 2 clusters of processing equipment 1 processing building 1 support building

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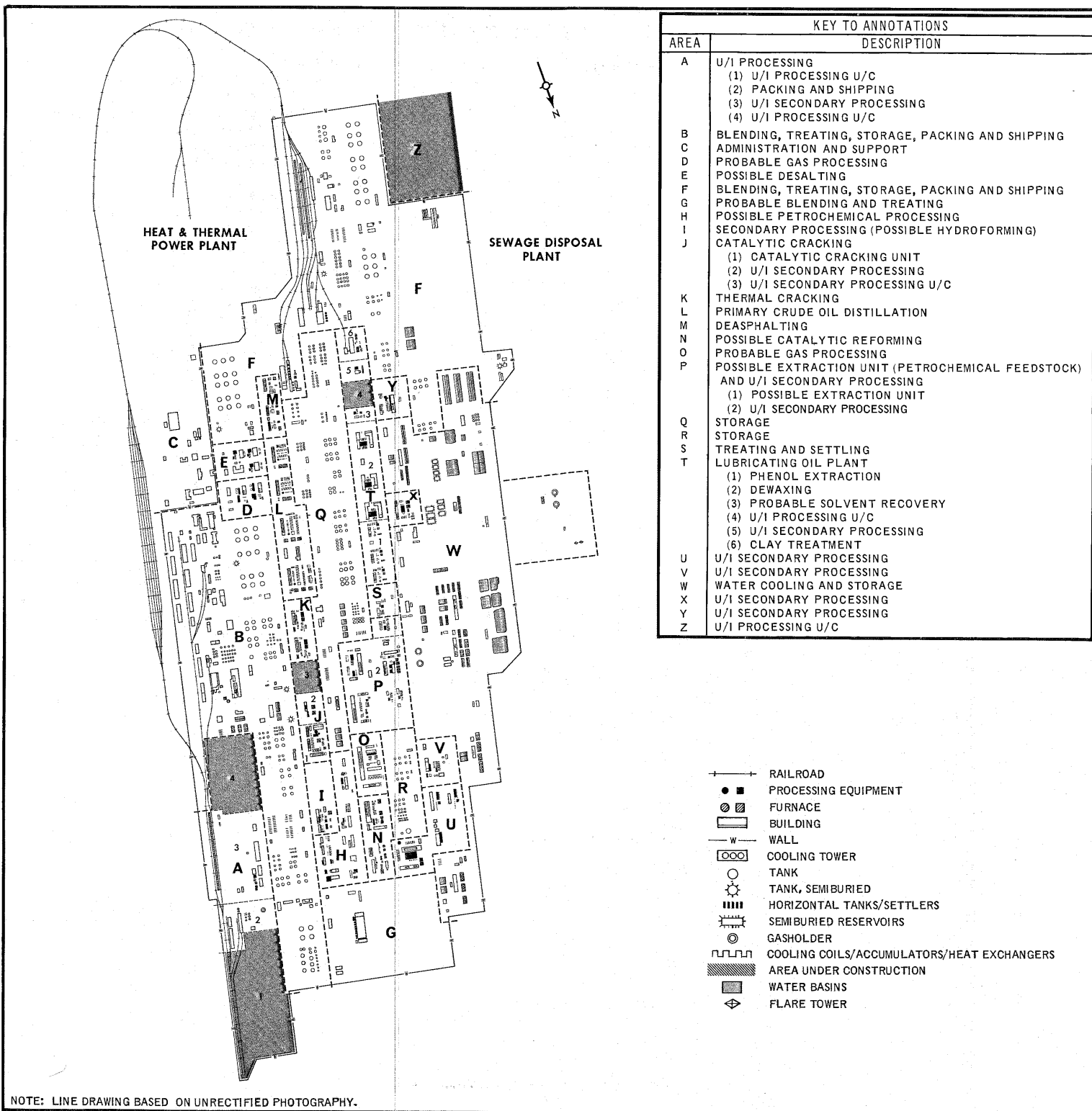
FIGURE 2. UFA PETROLEUM REFINERY, NOVO CHERNIKOVSK, USSR.

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<u>Area</u>	<u>Functional Description</u>	<u>Equipment and Facilities</u>	
J	Catalytic Cracking (1) Catalytic Cracking Unit	1 Fluid bed unit with 1 reactor 1 regenerator 2 fractionating columns 1 cluster of processing equipment 2 pipe furnaces 1 bank of heat exchangers/cooling coils/accumulators 2 pump buildings 1 control building 1 processing building 1 Light-ends unit with 4 columns 1 bank of heat exchangers/cooling coils/accumulators 1 compressor building 2 support buildings 6 cylindrical storage tanks 2 [redacted] 4 [redacted]	25X1
	(2) U/I Secondary Processing	1 Unit with 3 columns 2 pipe furnaces 1 pump building	
	(3) Secondary Processing U/C		
K	Thermal Cracking	2 Units, each with 4 columns 2 pipe furnaces 5 banks of heat exchangers/cooling coils/accumulators 1 light-ends recovery column 1 pump building 1 compressor building 1 control building 2 support buildings 1 horizontal storage tank, 12 meters long	
L	Primary Crude Oil Distillation	1 Multistage unit with 1 vacuum column 1 atmospheric column 4 columns 1 bank of accumulators 2 banks of heat exchangers/cooling coils/accumulators 4 pipe furnaces 1 pump building 1 control building 8 cylindrical storage tanks 5 [redacted] 3 3-meter-diameter 1 probable treating building with 6 horizontal treating/desalting tanks 1 support building 8 cylindrical storage tanks, 3 meters diameter	25X1

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Area	Functional Description	Equipment and Facilities	
L (Cont)		<ul style="list-style-type: none"> 1 Multistage unit with <ul style="list-style-type: none"> 1 vacuum column 1 atmospheric column 4 columns 1 bank of accumulators 2 banks of heat exchangers/cooling coils/accumulators 3 pipe furnaces 1 pump building 1 control building 1 support building 6 cylindrical storage tanks <ul style="list-style-type: none"> 2 [redacted] 25X1 4 3-meter-diameter 5 horizontal storage tanks, 12 meters long 2 Multistage units, each with <ul style="list-style-type: none"> 1 vacuum column 1 atmospheric column 4 columns 6 recycle towers 1 bank of accumulators 1 bank of heat exchangers 2 pipe furnaces 1 pump building 2 cylindrical storage tanks, [redacted] 25X1 [redacted] 25X1 1 treating building with <ul style="list-style-type: none"> 7 horizontal treating/desalting tanks 4 cylindrical storage tanks, 3 meters in diameter 2 Support buildings 	
M	Deasphalting	<ul style="list-style-type: none"> 2 Units, each with <ul style="list-style-type: none"> 4 columns 1 pipe furnace 1 pump building 1 control building 6 cylindrical storage tanks <ul style="list-style-type: none"> 2 [redacted] 25X1 4 3-meter-diameter 3 horizontal storage tanks, 6 meters long 1 Support building 1 U/I processing unit with <ul style="list-style-type: none"> 5 columns 2 banks of heat exchangers/cooling coils/accumulators (one on top of building roof) 1 pipe furnace 1 pump building 1 control building 6 cylindrical storage tanks <ul style="list-style-type: none"> 4 [redacted] 25X1 2 3-meter-diameter 	

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Area	Functional Description	Equipment and Facilities
N	Possible Catalytic Reforming	<p>2 Units including</p> <ul style="list-style-type: none"> 1 double unit with 4 reactors 4 banks of heat exchangers/cooling coils/accumulators 2 pipe furnaces 1 pump building 1 possible fractionating unit with 1 cluster of processing equipment, 6 columns, 2 pipe furnaces, 1 bank of heat exchangers/cooling coils/accumulators, 1 treating building with 7 horizontal tanks, 1 compressor building, 1 support building, and 1 cylindrical storage tank <p>25X1</p> <ul style="list-style-type: none"> 1 double unit with 4 reactors 2 banks of heat exchangers/cooling coils/accumulators 2 pipe furnaces 1 pump building 1 possible fractionating unit with 6 columns, 3 banks of heat exchangers/cooling coils/accumulators, (one on a building roof), 2 pipe furnaces, 1 compressor building, 4 support buildings, and 1 cylindrical storage tank <p>25X1 25X1</p>
O	Probable Gas Processing	<p>1 Combination unit with</p> <ul style="list-style-type: none"> 1 row of 6 columns 1 row of 12 columns 2 rows of 3 driers/absorbers 1 cluster of processing equipment 3 banks of heat exchangers/cooling coils/accumulators 2 compressor buildings 5 processing buildings 1 horizontal storage tank, 13 meters long
P	Possible Extraction Unit (Petrochemical Feedstock) and U/I Secondary Processing	<p>(1) Possible Extraction Unit</p> <p>1 Unit with</p> <ul style="list-style-type: none"> 5 columns 1 cluster of processing equipment 4 banks of heat exchangers/cooling coils/accumulators 1 compressor building 1 support building <p>(2) U/I Secondary Processing</p> <p>1 Unit with</p> <ul style="list-style-type: none"> 2 rows of 3 columns 1 row of 4 columns 1 bank of heat exchangers/cooling coils/accumulators 3 pipe furnaces 3 pump buildings 2 processing buildings 1 support building 2 cylindrical storage tanks 1 horizontal storage tank, 12 meters long <p>25X1 25X1 25X1</p>

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Area	Functional Description	Equipment and Facilities	
P (Cont)		1 Unit with 1 row of 4 columns 1 row of 2 columns 2 clusters of processing equipment 2 banks of heat exchangers/cooling coils/accumulators 5 compressor buildings 2 support buildings 1 Unit with 2 columns 4 clusters of processing equipment 1 bank of heat exchangers/cooling coils/accumulators 5 pipe furnaces 4 processing buildings 1 pump building 1 control building 3 support buildings 2 cylindrical storage tanks, 15 meters in diameter 2 horizontal storage tanks, 9 meters long 2 Units, each with 2 columns 1 bank of heat exchangers/cooling coils/accumulators 1 pipe furnace 1 pump building 1 support building common to both units 1 Unit with 7 columns 1 compressor building 1 cylindrical storage tank, 6 meters in diameter	
Q	Storage	15 Miscellaneous buildings 169 Cylindrical storage tanks 9 [redacted] 32 12-meter-diameter 7 [redacted] 27 9-meter-diameter 54 [redacted] 22 6-meter-diameter 16 [redacted] 2 3-meter-diameter 21 Horizontal storage tanks 2 15-meter-long 19 12-meter-long 8 Water storage basins	25X1 25X1 25X1 25X1 25X1
R	Storage	2 Support buildings 48 Cylindrical storage tanks 1 21-meter-diameter 12 [redacted] 6 12-meter-diameter 1 9-meter-diameter 7 [redacted] 11 6-meter-diameter 10 [redacted]	25X1 25X1 25X1 25X1

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<u>Area</u>	<u>Functional Description</u>	<u>Equipment and Facilities</u>
S	Treating and Settling	1 Unit with 5 batch agitators 4 mixing towers, each with one horizontal settling drum 1 processing building 2 support building 1 cylindrical storage tank, 25X1 3 horizontal storage tanks 25X1 2 13.5-meter-long 1 6-meter-long
T	Lubricating Oil Plant	
	(1) Phenol Extraction	3 Units, each with 2 groups of 3 columns 1 bank of heat exchangers/cooling coils/accumulators 2 pipe furnace 1 pump building 2 support buildings 3 cylindrical storage tanks, 25X1 4 horizontal storage tanks, 9 meters long 25X1 1 support building
	(2) Dewaxing	3 Units each with 1 cluster of processing equipment 2 banks of heat exchangers/cooling coils/accumulators 2 processing buildings 1 cylindrical storage tank, 25X1 1 Support building 25X1
	(3) Probable Solvent Recovery	1 Unit with 3 columns 2 banks of heat exchangers/cooling coils/accumulators 1 pipe furnace 2 processing buildings 2 cylindrical storage tanks, 3 meters in diameter 4 horizontal storage tanks, 25X1 25X1
	(4) U/I Processing U/C	
	(5) U/I Secondary Processing	1 Unit with 1 cluster of processing equipment 1 processing building 6 cylindrical storage tanks, 25X1 25X1
	(6) Clay Treatment	1 Unit with 4 columns 10 treating tanks 1 bank of heat exchangers/cooling coils/accumulators 2 pipe furnaces 2 packing buildings 2 cylindrical storage tanks, 3 meters in diameter

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Area	Functional Description	Equipment and Facilities	
U	U/I Secondary Processing	2 Units, each with 1 row of 7 columns 1 row of 6 columns 1 cluster of processing equipment 1 pipe furnace 1 pump building 1 Unit with 1 column 1 cluster of processing equipment 4 processing buildings 1 Unit with 1 row of 5 columns 1 very-large-diameter column 1 cluster of processing equipment 2 banks of heat exchangers/cooling coils/accumulators 2 pipe furnaces 2 pump buildings 1 processing building	
V	U/I Secondary Processing	1 Unit with 10 columns/reactors sticking out of roof of a building 2 treating/mixing tanks 1 cluster of processing equipment 1 bank of heat exchangers/cooling coils/accumulators 2 petrochemical furnaces 4 processing buildings 2 support buildings 3 cylindrical storage tanks, 12 meters in diameter	
W	Water Cooling and Storage	44 Miscellaneous buildings 33 Cooling towers 10 Cylindrical storage tanks 1 12-meter-diameter 3 9-meter-diameter 6 4 Gasholders, 6 Horizontal storage tanks 4 24-meter-long 2 12-meter-long 2 Flare towers 10 Semiburied reservoirs 27 Water basins	25X1 25X1
X	U/I Secondary Processing	1 Unit with 2 groups of 3 columns 1 cluster of processing equipment 1 bank of heat exchangers/cooling coils/accumulators 3 pipe furnaces 1 pump building 1 processing building 1 control building 4 cylindrical storage tanks, 2 horizontal storage tanks, 15 meters long	25X1 25X1

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<u>Area</u>	<u>Functional Description</u>	<u>Equipment and Facilities</u>	
Y	U/I Secondary Processing	1 Unit with 1 column 2 clusters of processing equipment 1 treating building with 10 treating tanks 1 building with 4 columns sticking out of the roof 3 processing buildings 1 support building 1 gasholder,	25X1
Z	U/I Processing U/C		

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REFERENCES

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Map

8th RTS. US Air Target Chart, Series 200, Sheet M0165-10HL, 3rd edition, March 1969, Scale 1:200,000 (SECRET)

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Requirement

COMIREX N02
Support Number 420508

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